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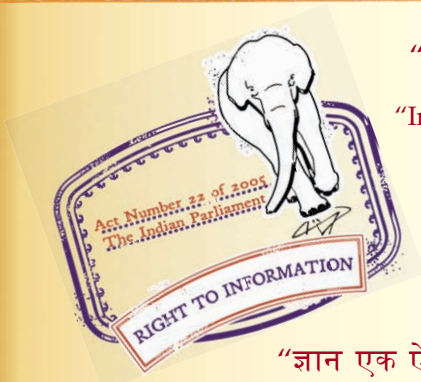
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IS 5350-1 (1970): Dimensions of Indoor and Outdoor Porcelain Post Insulators and Post Insulator Units for Systems with Nominal Voltages Greater than 1000 V, Part I: Indoor Post Insulators [ETD 6: Electrical Insulators and Accessories]



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“Knowledge is such a treasure which cannot be stolen”

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IS: 5350 (Part I) - 1970

Indian Standard

**DIMENSIONS OF INDOOR AND OUTDOOR
PORCELAIN POST INSULATORS AND POST
INSULATOR UNITS FOR SYSTEMS WITH
NOMINAL VOLTAGES GREATER
THAN 1000 V**

PART I INDOOR POST INSULATORS

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

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DIMENSIONS OF INDOOR AND OUTDOOR PORCELAIN POST INSULATORS AND POST INSULATOR UNITS FOR SYSTEMS WITH NOMINAL VOLTAGES GREATER THAN 1000 V

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Indian Standard

DIMENSIONS OF INDOOR AND OUTDOOR PORCELAIN POST INSULATORS AND POST INSULATOR UNITS FOR SYSTEMS WITH NOMINAL VOLTAGES GREATER THAN 1000 V

PART I INDOOR POST INSULATORS

0. FOREWORD

0.1 This Indian Standard (Part I) was adopted by the Indian Standards Institution on 25 May 1970, after the draft finalized by the Electrical Insulators and Accessories Sectional Committee had been approved by the Electrotechnical Division Council.

0.2 This standard is intended to establish standard values of those electrical characteristics, mechanical characteristics and dimensions that are essential to the interchangeability of post insulators and post insulator units. The general definitions and methods of tests of post insulators are covered by IS: 2544-1963*.

0.3 This standard covers 3 types of post insulators in the following three parts:

Part I Indoor post insulators

Part II Outdoor cylindrical post insulators

Part III Outdoor pedestal post insulators

0.3.1 The three types of insulators are distinguished by their electrical, mechanical and dimensional characteristics. Figure 1 (*see P 6*) illustrates typical example of indoor post insulator. The drawing is only general illustration and other shapes and constructions are permitted, for example, the metal fittings of indoor post insulators may not protrude beyond the insulating part.

0.4 In the preparation of this standard, assistance has been derived from IEC Publication 273 (1968) 'Dimensions of Indoor and Outdoor Post Insulators and Post Insulator Units for Systems with Nominal Voltages Greater than 1000 V' issued by the International Electrotechnical Commission.

*Specification for porcelain post insulators (3.3 kV and above). (Since revised).

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0.5 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS:2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard (Part I) applies to post insulator of ceramic material intended for indoor service in electrical installations or equipment operating on alternating current with a rated voltage greater than 1 000 V and a frequency not greater than 100 Hz. The insulators covered by this standard are primarily intended for use in isolators (disconnectors) or as bus bar or fuse supports.

2. ELECTRICAL CHARACTERISTICS

2.1 Each post insulator is designed for a specified impulse withstand voltage in accordance with IS: 2544-1963†. The corresponding power frequency withstand voltage is also given. The system voltage is not specified because depending on service conditions, it may be necessary to choose different insulators for a given system voltage.

3. MECHANICAL CHARACTERISTICS

3.1 Post insulators are standardized in mechanical strength classes based on values of the specified failing load in the bending test, chosen to conform, as far as possible, with current practice. Unless otherwise agreed, it is assumed that a post insulator is to be mounted in the upright position, that is, with the live end at the top. It is also assumed that the load is applied at the top surface. Where insulators are to be mounted underhung, the standard values of bending strength may not be applicable. If the weight of the post insulator is not negligible, other positions of mounting (for example, horizontal) may also affect the strength. The appropriate strength rating for methods of mounting other than upright shall be subject to agreement between the manufacturer and the purchaser.

3.2 The mechanical strength classes for indoor post insulators are as follows:

Strength Class	1.8	1 800 N
" "	3.75	3 750 N
" "	7.5	7 500 N

*Rules for rounding off numerical values (*revised*).

†Specification for porcelain post insulators (33 kV and above). (*Since revised*).

3.3 Mechanical strengths in tension or compression are also given. For post insulators, a failing load P_x may also be specified and will refer to a load applied at x mm above the top face of the insulator. The value of such loads shall be subject to agreement between the manufacturer and the purchaser. For indoor insulators, values P of are specified in Table 1.

4. DIMENSIONAL CHARACTERISTICS

4.1 The following important dimensions for indoor post insulators are specified:

- a) Overall height, and
- b) Maximum diameter of the insulating part.

4.2 The overall heights of post insulators specified in this standard have been chosen to permit the insulators to comply with the specified electrical characteristics when tested in accordance with IS: 2544-1963*.

4.2.1 When the arrangement of the insulators in service differs appreciably from the standard arrangement for test, the electrical characteristics under service conditions may be different. Exceptional cases may require special precautions or even the choice of a larger insulator.

4.3 The nominal dimensions of an insulators shall not be greater than the specified maximum or less than the specified minimum values. Actual dimensions of insulators are subject to manufacturing tolerances.

5. REQUIREMENTS

5.1 The specified characteristics of indoor post insulators are given in Table 1. All insulators of the same impulse voltage rating are grouped together.

5.2 To reduce the number of standard units, some ratings have been covered by the use of post insulators of higher ratings. Guidance to the selection of insulators in such cases is given in Appendix A.

6. DESIGNATION OF POST INSULATORS

6.1 Each standard post insulator is assigned a reference symbol which indicates the insulator type. The symbol for indoor post insulator is 'J'.

6.2 Strength Class—The indoor post insulators are classified into the following mechanical strength classes:

1.8, 3.75 and 7.5

*Specification for porcelain post insulators (33 kV and above). (Since revised).

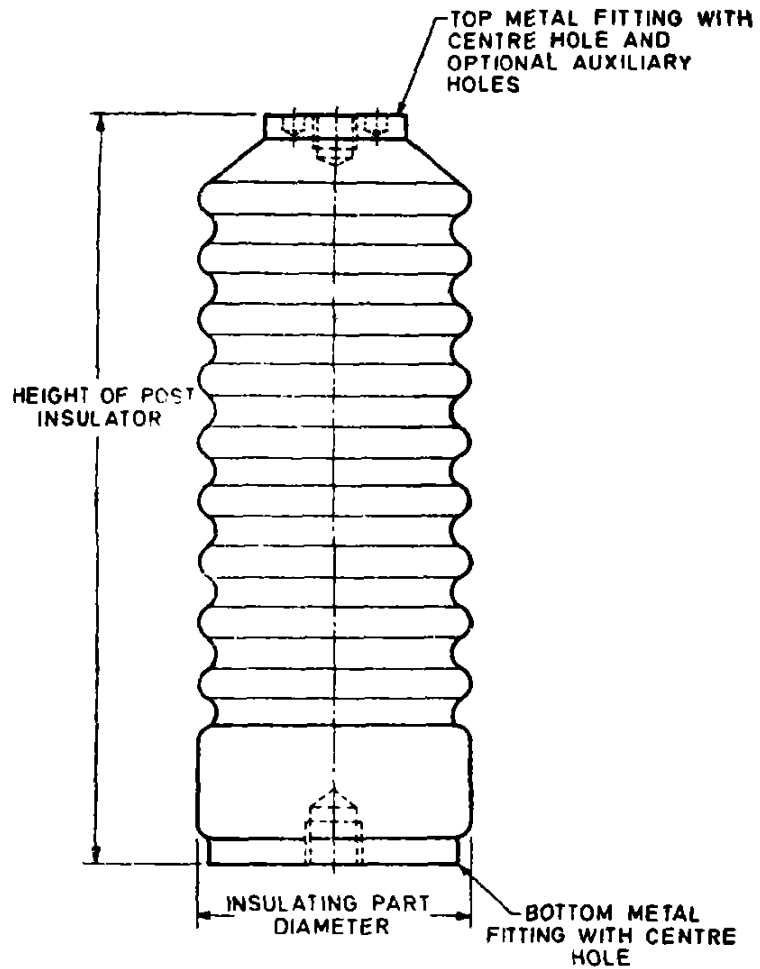


FIG. 1 EXAMPLE OF AN INDOOR POST INSULATOR

TABLE 1 CHARACTERISTICS OF STANDARD INDOOR POST INSULATORS

(Clauses 3.3 and 5.1)

POST INSULATOR DESIGNATION	IMPULSE WITHSTAND VOLTAGE	POWER FREQUENCY WITHSTAND VOLTAGE (Dry)	HEIGHT OF POST INSULATOR	INSULATING PART DIAMETER, Max	FAILING LOAD, Min				TOP METAL FITTING					BOTTOM METAL FITTING		
					Bending	Tension	Compression	Maximum Diameter	Centre Hole (Tapped)	Optional Auxiliary Holes (see Note 2)			Maximum Diameter	Centre Hole (Tapped)		
										Bolt holes (tapped)	Threaded depth of holes, Min	Distance between hole centres				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	
	kV	kV	mm	mm	N	N	N	N	mm			mm	mm	mm		
J 1-8-45	45	21	95 ± 1	60	1 800	1 250	3 500	7 000	40	M 12	—	—	—	55	M 12	
J 3-75-45	45	21	95 ± 1	75	3 750	2 500	5 000	10 000	60	M 12	M 6	6	36	70	M 16	
J 7-5-45	45	21	95 ± 1	85	7 500	5 000	9 000	18 000	70	M 16	M 10	6	46	90	M 16	
J 1-8-60	60	27	120 ± 1	60	1 800	1 350	3 750	7 500	40	M 12	—	—	—	55	M 12	
J 3-75-60	60	27	120 ± 1	75	3 750	2 700	5 250	10 500	60	M 12	M 6	6	36	70	M 16	
J 7-5-60	60	27	120 ± 1	85	7 500	5 400	9 250	18 500	70	M 16	M 10	6	46	90	M 16	
J 1-8-75	75	35	130 ± 1	60	1 800	1 350	3 750	7 500	40	M 12	—	—	—	55	M 12	
J 3-75-75	75	35	130 ± 1	75	3 750	2 700	5 250	10 500	60	M 12	M 6	6	36	70	M 16	
J 7-5-75	75	35	130 ± 1	100	7 500	5 400	10 000	20 000	70	M 16	M 10	6	46	95	M 20	
J 1-8-125	125	55	225 ± 1	75	1 800	1 550	4 000	8 000	40	M 12	—	—	—	70	M 12	
J 3-75-125	125	55	225 ± 1	85	3 750	3 100	5 500	11 000	60	M 12	M 6	6	36	80	M 16	
J 7-5-125	125	55	225 ± 1	125	7 500	6 200	11 000	22 000	70	M 16	M 10	6	46	115	M 20	
J 1-8-170	170	75	310 ± 1	75	1 800	1 650	4 500	9 000	40	M 12	—	—	—	70	M 12	
J 3-75-170	170	75	310 ± 1	105	3 750	3 300	6 500	13 000	60	M 12	M 6	6	36	100	M 16	
J 7-5-170	170	75	310 ± 1	130	7 500	6 600	13 000	26 500	70	M 16	M 10	6	46	120	M 24	
J 3-75-325	325	140	620 ± 1	130	3 750	3 500	10 000	20 000	60	M 12	M 6	6	36	165	M 20	
J 7-5-325	325	140	620 ± 1	160	7 500	7 000	20 000	40 000	80	M 16	M 10	6	46	180	M 24	

NOTE 1 — The specified dimensions permit the use of bolts which, at the specified failing load of the post insulator, are not stressed beyond 220 N/mm²

NOTE 2 — The auxiliary holes are optional and their inclusion shall be subject to agreement between the manufacturer and the purchaser

NOTE 3 — The threads shall conform to IS 4218 'ISO metric screw threads'

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6.2.1 The mechanical strength for these classes has been indicated in 3.2.

3.3 Impulse Withstand Voltage—The impulse withstand voltage values for indoor post insulators are as follows:

45, 60, 75, 125, 170 and 325 kV.

NOTE—The designation does not always fully specify the insulator, as sometimes alternative constructions are included in the standard, for example, the indoor post insulators may or may not have auxiliary holes in the top metal fittings

Example:

‘IS post insulator type J 3-75-125’ indicates an indoor post insulator of strength class 3-75 and impulse withstand voltage 125 kV.

APPENDIX A

(Clause 5.2)

GUIDE TO THE SELECTION AND COMPOSITION OF INDOOR POST INSULATORS

REQUIRED WITHSTAND VOLTAGE		REQUIRED MECHANICAL STRENGTH		
Impulse	Power Frequency (Dry)	Class 1 8 1 800 N	Class 3 75 3 750 N	Class 7 5 7 500 N
kV	kV			
(1)	(2)	(3)	(4)	(5)
45	21	J 1-8-45	J 3-75-45	J 7-5-45
60	27	J 1-8-60	J 3-75-60	J 7-5-60
75	35	J 1-8-75	J 3-75-75	J 7-5-75
125	55	J 1-8-125	J 3-75-125	J 7-5-125
170	75	J 1-8-170	J 3-75-170	J 7-5-170
325	140	J 3-75-325	J 3-75-325	J 7-5-325

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